CHAPTER 3

PROJECTING RETIREMENT INCOME FROM PENSIONS

I. OVERVIEW

The pension projection module estimates pension income for future retirees under two scenarios. The first assumes retirement at age 62 and the second assumes retirement at age 67. Two sets of output variables are produced. The first provides annual benefits from defined benefit (DB) plans, annuitized benefits from defined contribution (DC) accounts (including Keoghs) and IRAs, and account balances of DC accounts (including Keoghs) and IRAs, all as of age 62 under the scenario that assumes retirement at age 62. The second provides similar output as of age 67 under the scenario that assumes retirement at age 67.

The projections of future pension benefits are based primarily on information reported by each adult in the Retirement Expectations and Pension Plan Coverage topical module of the SIPP. This module includes information regarding the type of pension and years of pension plan participation, employee contributions toward pension plans, and 401(k) account balances. In addition, the Annual Income and Retirement Accounts topical module is used to obtain information on annual contributions to 401(k), IRA, and Keogh accounts. The Assets and Liabilities topical module is used to obtain information about IRA and Keogh account balances.

Because some workers who are not covered by a pension plan at the time of the SIPP survey will move into DB or DC pension plans over time, we increase future pension plan participation among workers not currently participating. As people age and possibly earn more income, we randomly assign future pension coverage based on current pension participation rates in the 1990-1993 SIPP based on gender and income quintile.

The pension module is written in the form of subroutines. The module consists of a main program (PENSION.SAS) and other programs that perform the calculations for the different types of pensions. These other programs are called automatically by the main program; there is no need to run the subroutines separately. Through edits in PENSION.SAS, changes can be made easily to many of the underlying assumptions, including the following:

real rate of return on stock investments
real rate of return on bond investments
long run CPI growth factor
proportion of DC contributions (and initial account balances) allocated to stocks

proportion of DC contributions (and initial account balances) allocated to bonds
percentage of benefit paid to widow(er) in a joint and survivor plan
the reduction factor applied to DC annualized benefits to account for risk aversion
the loading factor applied to DC annualized benefits

Separate documentation is available that provides more detail on the main pension program and each of the other programs in the pension module. In addition, the programs themselves are documented.

II. DEFINED BENEFIT (DB) PLAN ESTIMATES

DB benefits are projected using Bureau of Labor Statistics (BLS) replacement rates that vary by years of service in the plan, final salary, age at retirement, occupation, and sector of employment. Rather than using replacement rates from BLS, we had considered matching specific pension plan information from the Health and Retirement Survey or the Pension Benefit Guarantee Corporation's Pension Information Management System (PBGC's PIMS) model. This would provide more heterogeneity in pension benefits. However, after consultation with SSA, we decided to focus our efforts on improving and enhancing the other components of the pension model. Matching plans from other data sources onto SIPP pension plan participants is a possible enhancement for future versions of the model.

The pension model also adjusts DB benefits to account for future job changes, cost-of-living adjustments, and labor force departures prior to attaining age 62 (67). Benefits expected from pensions on previous jobs and current pension income are also included in the DB benefit estimates. We also include pre-retirement survivor benefits. Consistent with SSA's previous pension projection model, we assume that all married workers take a joint and survivor benefit, and adjust initial benefit levels accordingly. We assume that survivors receive 50 percent of the benefit the couple received while both spouses were alive.

One area that was not pursued for this version of the model is the emergence of cash balance plans. Recently, some firms have converted their DB plans to cash balance plans, and cash balance plans may become more prevalent in the future. Among other differences, the accrual patterns in cash balance plans are not as backloaded as accrual patterns in DB plans. However, at this time, the market penetration of cash balance plans is relatively small and data on cash balance plans are only recently becoming available. It may be desirable to incorporate cash balance plans into future versions of the model.

More detail on the method for estimating defined benefits is provided below.

1. Replacement Rates

DB benefit levels are projected using replacement rates that vary by years of service in the plan, final salary, age at retirement, occupation, and sector of employment. These

replacement rates, based on BLS tables, include adjustments for early retirement reductions and Social Security integration. The BLS stopped determining occupation specific replacement rates after 1989. Therefore, we developed occupation specific replacement rates by adjusting the replacement rates in 1993 (BLS, 1994, table 147), using the occupation specific replacement rates in 1989 (BLS, 1990, table 85).

2. Final Salary

Final salary estimates vary by the sector of employment and reflect the earnings from the earnings projection module. For private sector workers, final salary is estimated as the average of the highest 5 consecutive years of earnings out of the 10 years preceding retirement. This is the modal method of determining final salary, according to the BLS (1998, table 116).

For federal, state, and local government workers, final salary is estimated as the average of the highest three consecutive years of earnings. For military personnel who joined in or before 1980, the final salary is the last year of earnings. For those joining after 1980, the final salary is the highest three years of earnings.

3. Accounting for Retirement Prior to Age 62 (67)

The pension model incorporates output from the earnings projection model to reflect that some people stop working prior to attaining age 62 (67). The model assumes that individuals work up to the time their earnings drop to zero (or until age 62 (67), whichever is less). Note however, that even for individuals who stop working prior to age 62 (67), we assume that they do not start collecting their pension benefits until age 62 (67).

We had considered allowing workers to begin receiving benefits prior to age 62 (67) so that the commencement of benefits would coincide with labor force withdrawal. If this method were pursued, we would need to reduce pension benefits accordingly and also account for any increase in other non-pension assets due to this income. However, we decided that, at least to some extent, our potential overstatement of pension benefits at age 62 (67) is offset by an understatement of other non-pension assets at age 62 (67). In other words, people who start collecting their pension benefits early might save some of this income, thereby increasing their assets, and therefore increasing their future income from assets at age 62 (67). Therefore, we decided not to introduce the additional complexity of allowing for receipt of pension income prior to age 62 (67). We use this strategy to minimize bias in *total* wealth, rather than to minimize bias in any particular wealth source. However, it might be preferable to revise this strategy in future versions of the model.

4. Cost-of-Living Adjustments (COLAs)

We incorporated COLAs for two reasons. First, in the pension projection module, we need to project the pension income at ages 62 and 67 for persons already collecting pension

income at the time of the SIPP interview. These projections need to account for any cost-of-living adjustments granted between the time of the interview and ages 62 and 67. Second, when projecting income to the year 2020 in task 7, DB pension income estimates need to account for any cost-of-living adjustments. (Note that 'cost-of-living adjustment' is somewhat of a misnomer; a better term is 'post-retirement benefit increase'. However, we use the terms interchangeably.)

The DB variables output from the pension module will already reflect cost-of-living adjustments granted prior to age 62 and 67. In addition, the pension module outputs variables needed for the module that projects income to 2020.

The table below summarizes the COLA assumptions used. We randomly assign workers to receive COLAs according to assumptions that vary by sector. The assumptions for each sector are described in more detail in the sections that follow.

Table 3-1
Summary of COLA Assumptions

Sector	Proportion With COLA	COLA Calculation
Private	10%	50 percent of Consumer Price Index (CPI) increase
State and Local	60%	CPI increase up to 3 percent
Federal-FERS	100%	Annual adjustments payable only to retirees age 62 or older (unless they are disability or survivor annuities). Adjustments, unless limited by law, are equal to: (1) the increase in the CPI, if the CPI increases 2 percent or less; (2) 2 percent, if the CPI increases between 2 and 3 percent; (3) the CPI increase minus 1 percent, if the CPI increases 3 percent or more
Federal-CSRS	100%	Annual adjustments fully indexed to the CPI for all annuitants.
Military--Entered on or before 7/31/86	100%	CPI increase
Military--Entered after 7/31/86	100%	PI increase minus 1 percent

Private Sector Employees

Although very few pension plan beneficiaries receive automatic COLAs, many receive ad hoc pension increases. During the 1970s, a majority of DB beneficiaries received cost-of-living adjustments, although most of these were granted on an ad hoc nature rather than automatically (Allen et al 1985). The post-retirement adjustments during this period amounted to about 40 percent of the CPI increase.

During the 1980s, however, defined benefit plans became much less likely to grant ad hoc post-retirement increases (Allen et al, 1992, Weinstein, 1997). Part of the decline appears related to lower inflation; fewer plans grant increases in times of lower inflation. Even in the early 1990s, though, when inflation rates were similar to those in the late 1980s, there were further decreases in the proportion of workers in plans which granted COLAs.

Weinstein (1997) examines the trends in the proportion of workers that are in DB plans that granted post-retirement increases to their retirees. In 1983, 54 percent of full-time DB pension participants were in plans that either granted automatic COLAs or discretionary ad hoc increases to retirees in the last 5 years. This proportion decreased to 10 percent and 7 percent in 1993 and 1995, respectively. We assume that 10 percent of all private sector DB beneficiaries receive post-retirement benefit increases. This is slightly higher than the percentage in 1995, and will therefore allow for a slightly higher proportion of plans that grant ad hoc increases in higher inflationary periods.

In the latest years for which information is available (1983-1988), post-retirement increases amounted to about half of the CPI increase (Weinstein, 1997). Therefore, we assume that post-retirement benefit increases (for those receiving them) are equal to one half of the CPI increase. Although Weinstein (1997) finds that on average, workers with lower benefits receive higher post-retirement increases relative to workers with higher benefits, for simplicity, we do not vary CPI increases by benefit level.

State and Local Employees

State and local employees are much more likely to receive a post-retirement benefit increase than private sector workers. According to Weinstein (1997), 62 percent of state and local government workers were in plans that granted post-retirement benefit increases, the majority of which were automatic cost-of-living adjustments rather than ad hoc increases. The higher rate of increase among public employees is likely due in part to a higher proportion of state and local employees not being covered by Social Security, which grants automatic COLAs. About one-quarter of state and local workers are not covered by Social Security, whereas nearly all private sector workers are covered. It would be preferable to have separate COLA assumptions for covered and non-covered state and local workers. However, post-retirement pension increase information is not available for each group separately. Therefore, we assume

that 60 percent of state and local workers receive post-retirement benefit increases, regardless of whether the worker is covered by Social Security.

Of the state and local plans that provide post-retirement benefit increases, about 60 percent limit the increase to 3 percent or less per year (BLS 1988, table 69). Therefore, we assume that the state and local workers assigned to receive post-retirement benefit increases receive increases equal to the increase in CPI up to a maximum of 3 percent.

Federal Employees

COLA factors for federal employees are straightforward. Federal retirees receive cost-of-living adjustments according which plan they are in--FERS or CSRS.

FERS provides annual adjustments payable only to retirees age 62 or older (unless they are disability or survivor annuities). Adjustments, unless limited by law, are equal to:

(1) the increase in the CPI, if the CPI increases 2 percent or less;
(2) 2 percent, if the CPI increases between 2 and 3 percent;
(3) the CPI increase minus 1 percent, if the CPI increases 3 percent or more.

CSRS provides annual adjustments fully indexed to the CPI for all annuitants.

The table below shows the actual cost-of-living adjustments for federal plans from 1990 through 1997.

Table 3-2
Actual COLAs for 1990-1997, Federal Plans

Month and Year of Increase	FERS	CSRS
January 1990	3.7%	4.7%
January 1991	4.4	5.4
January 1992	2.7	3.7
January 1993	2.0	3.0
April 1994	2.0	2.6
April 1995	2.0	2.8
April 1996	2.0	2.6
January 1997	2.0	2.9

Military Personnel

COLA factors for military personnel depend on the date they entered service. Those entering service on or before 7/31/86 receive COLAs equal to the CPI increase. Those entering after 7/31/86 receive COLAs equal to the CPI increase minus one percent.

5. Benefit Reductions for Job Changes

Few workers remain on the same job throughout their career. Workers with defined benefit coverage who change jobs receive lower pension benefits than those who do not change jobs. This results in part because the salaries used in benefit computations are not indexed. Therefore, we adjust benefits to take into account future job changes among workers with DB coverage. This involves two steps. First we determine who changes a job and if so how often. Second, we determine how benefits are reduced for those who change jobs.[1]

Determining Who Changes Jobs and How Often.

We base our estimates of who experiences a job change on the assumption that each year 5 percent of workers in jobs with DB pension coverage will change jobs. This assumption is based on Gustman and Steinmeier's (1995) finding that the average annual rate of job change among male pension participants age 31-50 is 6 percent. We use a 5 percent rate rather than a 6 percent rate to reflect multi-employer plans. That is, workers covered by multi-employer plans will be able to keep their DB coverage without disruption when they change jobs.

Although there is some evidence that the rate of job change is higher for some workers (e.g. younger workers, workers with shorter tenure, workers in certain industries) and lower for other workers (e.g. older workers, workers with longer tenure, workers in certain industries), for simplicity we do not vary the job change rate by either worker or employment characteristics.

The table below shows the resulting distribution of workers across the number of job changes, by the number of years of service remaining in their career. (Years of service remaining is the number of years from a worker's current age until retirement.)

Table 3-3
Distribution of Workers Across Number of Job Changes

Number of Job Changes	Years of Service Remaining					
	35	30	25	20	15	10
0	16.6%	21.5%	27.7%	35.8%	46.3%	59.9%
1	30.6	33.9	36.5	37.7	36.6	31.5
2	27.4	25.9	23.0	18.9	13.5	7.5
3+	25.4	18.7	12.8	7.6	3.6	1.1

We assume that all workers age 50 or older remain on their current job until retirement. We also assume that workers with fewer than 10 years of service remaining until retirement remain on their current job until retirement.

Distribution of Job Tenure

Once we have determined how many jobs a worker has in his/her lifetime, we determine how long the worker holds each of these jobs. We've decided to structure a worker's career such that each job is twice as long as the job that preceded it. Two factors contributed to this decision. First, workers tend to change jobs earlier in their career rather than later. Second, the longer a person works on his/her last job, the less changing jobs affects their total pension income.

When determining the length of each job, we ignore information on the amount of service to date on a worker's present job as of the SIPP interview. Therefore, we will understate the time on the first job if the worker has already been on the job longer than we specify through our assumptions. For these workers, we will overstate the time on the last job, and thus, our reductions to pension income due to job changes may be slightly understated. (On the other hand, by ignoring tenure on the current job, we could overstate the probability of job change for those with longer tenures, and thus overstate the reductions to pension income due to job changes.)

The table below shows the resulting years of service on each job by the number of job changes and years of service. (Here, the years of service is the sum of the years of service remaining and the years of service to date on the current job.) For instance, we assume that a worker with 35 years of service who changes jobs 3 times will work 2 years on the first job, 5 years on the second, 9 years on the third, and 19 years on the fourth.

Table 3-4
Years of Service on Each Job, by Number of Job Changes

Total Years of Service	Number of Job Changes		
	1	2	3
35	12 years/23 years	5 years/10 years/20 years	2 years/5 years/9 years /19 years
30	10 / 20	4 / 9 / 17	2 / 4 / 8 / 16
25	8 / 17	4 / 7 / 14	2 / 3 / 7 / 13
20	7 / 13	3 / 6 / 11	1 / 3 / 5 / 11
15	5 / 10	2 / 4 / 9	1 / 2 / 4 / 8
10	3 / 7	1 / 3 / 6	1 / 1 / 3 / 5

Reduction in Pension Income

We calculated pension reduction factors that are based on the total years of service (years of service remaining plus years of service on current job to date), the number of job changes, and occupation. In calculating these factors we used a nominal wage growth rate of 4.4 percent. This assumption is based on the long-range intermediate wage growth assumption in the 1998 Social Security *Trustees' Report*.

The table below presents the reduction factors. They are applied to the final pension income. For instance, a professional/administrative worker with 35 years of service with one job change has a DB benefit equal to 83.1 percent of that of a similar worker with no job changes. (Because of the different accrual patterns of cash balance plans as well as the option for a lump-sum distribution upon employment-termination, the reduction factors calculated here will likely somewhat overstate the reduction due to job changes for those with cash balance plans.)

Table 3-5
Pension Reduction Factors

Total Years of Service	Occupation	Number of Job Changes		
		1	2	3
35	Prof/Admin	83.1%	78.8%	76.2%
	Tech/Clerical	82.6	78.1	75.3
	Prod/Service	86.2	83.3	80.6
30	Prof/Admin	81.7	72.9	69.2
	Tech/Clerical	80.8	71.7	67.9
	Prod/Service	85.8	76.6	72.6
25	Prof/Admin	85.4	74.6	71.4
	Tech/Clerical	84.2	73.1	69.9
	Prod/Service	89.7	78.0	74.6
20	Prof/Admin	90.4	80.4	78.2
	Tech/Clerical	89.2	79.1	77.0
	Prod/Service	94.0	83.2	80.7
15	Prof/Admin	97.1	63.2	58.7
	Tech/Clerical	96.7	62.8	58.3
	Prod/Service	100.0	62.3	58.0
10	Prof/Admin	79.8	73.1	66.3
	Tech/Clerical	79.8	73.1	66.3
	Prod/Service	80.5	74.0	67.4

Workers with Intervening Years of Zero Earnings

The earnings projections could include intervening years of zero earnings for some workers. In other words, these workers leave the work force and return at a later date. For simplicity, we treat workers with intervening years of zero earnings the same as other workers, except that the total years of service used to calculate the reduction factor will not include any years of zero earnings.

This may overstate the pension benefits for those with intervening years of zero earnings, but only for those who return to the work force in new jobs rather than returning to the same job. In any case, the projected pensions for workers with intervening years of zero earnings already partly account for any job changes by using years of service that are reduced for years of zero earnings.

6. Inclusion of Widow(er) Benefits

We include pre-retirement survivor benefits so that we do not understate the income for widow(ers) whose spouses died prior to receiving their pension income. For workers who die prior to age 62 (67), we determine what their pension would be at age 62 (67) if they had left their job the day prior to the day they died. We assume that each of these workers would have taken a 50 percent joint and survivor benefit. Then we assume that the surviving widow(er) begins to receive the survivor benefit when the worker would have attained age 62 (67), had he or she lived. This last assumption is made to be consistent with our assumption that workers do not begin to receive their pension benefits until they attain age 62 (67). For surviving spouses who start receiving survivorship benefits prior to attainment of age 62 (67), we apply COLA adjustments up to age 62 (67), as described above.

7. Current Retirement Income

About 4 percent of persons in the projection sample are currently collecting pension income, with their annual pension benefit averaging about $12,000. We project current pension income to ages 62 and 67. We assume that everyone in this group is collecting income from a DB plan, and we randomly assign COLA increases according to the COLA methods discussed above.

We also make assumptions regarding the survivorship status of those receiving pension benefits. We assume that pension recipients who are not married and report that they have joint and survivor plans are in survivorship mode. For those who are married and report that they have joint and survivor plans, we assume that they are collecting joint benefits. If a member of the couple dies before reaching age 62 or 67, we switch the surviving spouse to survivorship mode and reduce the benefits accordingly.

8. Benefits Expected from a Prior Job

About 11 percent of the persons age 55 to 64 in the 1990 projection sample and 9 percent of those in the 1991 sample expect to receive pension benefits from a prior job. The potential benefits from prior pension coverage can be substantial since workers age 55 to 64 were covered by these prior plans for an average of about 20 years.

The previous pension model already accounted for pensions from a prior job to the extent

that these prior pension plan balances are rolled over and included in IRA balances reported in the SIPP. Unfortunately, the 1990 SIPP does not include questions regarding previous lump sum distributions for those under age 62. In the 1991 SIPP, however, 25 percent of those ages 55-64 who expect to receive a pension benefit from a prior job also indicate they previously received a lump sum distribution. Of these, 38 percent claim to have rolled the distribution over. In other words, 10 percent (25% * 38%) of those expecting to receive pension benefits from a prior job also received a lump sum distribution that they then rolled over. This is probably the upper bound on any double counting that would occur if we ignore the possibility that some people who report they expect to receive pension income from a prior job have actually rolled over their pension benefits. Therefore, it is reasonable to accept this potential for double counting rather than to try to impute the proportion of those in the 1990 SIPP who have taken and rolled over any lump sum distributions.

For simplicity, we assume that all of those expecting benefits from a prior job have a DB plan. This is probably reasonable, since those with DC plans are more likely to be eligible for and receive lump sum distributions. To calculate benefits at age 62 and 67, we use the years covered under the plan and the salary as of the quit date (using earnings information from the earnings projection module) and apply the appropriate replacement rate as discussed above.

III. DEFINED CONTRIBUTION (DC) PLAN AND IRA ESTIMATES

The model separately projects account balances for 401(k) plans, non-401(k) DC plans, Keoghs, and IRAs. In general, the output variables for DC plans include 401(k), non-401(k) DC plans, and Keogh plans, but not IRA plans; IRA plan output variables are displayed separately. For plans where account balance information is available, the balance is projected to the retirement date. In addition, monthly contributions are accumulated from the time of the survey until the time of retirement. These contributions reflect the reported employee contribution rates, assigned employer match rates, and earnings projections. For plans where account balance information is not available, monthly contributions are accumulated over the entire period of plan participation.

The model assumes that account balances are invested 50 percent in stocks and 50 percent in bonds. Similarly, it assumes that new contributions are allocated 50 percent to stocks and 50 percent to bonds. Separate rates of return are applied to the stock and bond balances and contributions. The real rates of return are set stochastically. In future versions of the model, it might be desirable to allow for various allocation strategies by age, gender, tenure, and/or income, and to allow for portfolio rebalancing. Time and resource constraints made it impractical to incorporate such variations in this version of the model. The Employee Benefit Research Institute/ICF (EBRI/ICF) database on 401(k) plans is a potential source for informing this type of enhancement.

Upon the pre-retirement death of a worker, we transfer the DC account balance to the spouse.

We annuitize account balances upon attainment of age 62 (67) under two sets of mortality assumptions. The first uses unisex mortality assumptions based on the 1989-1991 Decennial Life Tables as published by the National Center for Health Statistics (NCHS). The second set uses mortality assumptions developed by RAND and based on Panel Study of Income Dynamics (PSID) data corrected for differences between the PSID and Vital Statistics. These mortality rates vary by gender, birth year, race, and education.

1. Employee Contribution Rates

Employee contribution rates for each account balance type (401(k), non-401(k), Keogh, and IRA) are based on self-reported SIPP data. We assume that the percentage contributed to each plan remains a constant percentage of earnings until retirement. We might want to relax this assumption in future versions of the model, and allow contributions to vary by age, gender, tenure, and/or income.

2. Employer Match Rates

The SIPP does not ascertain employer match rate information. We estimate match rates for 401k and non-401k DC plans separately.

401(k) Plans

Using the 1995 Survey of Consumer Finances (SCF), we examined employer and employee contribution rates for 401(k) plans. We found that the employer match decreases with increases in the employee contribution rate. This is consistent with Papke (1997) who finds that worker contribution rates decrease as the employer match increases.

Therefore, we vary employer match rates by the worker contribution rate. For those cases where we do not know whether the employer contributes, we randomly assign employer match rates based on the following distribution:

Table 3-6
Distribution of Workers by Employer Match Rate

Worker Contribution Rate	0% Match	50% Match	100% Match
0.01-5.00%	20%	20%	60%
5.01%+	20%	60%	20%

For those cases where we know whether the employer contributes, we randomly assign employer match rates to those workers whose employer contributes using the following distribution:

Table 3-7
Distribution of Workers by Employer Match Rate

Worker Contribution Rate	0% Match	50% Match	100% Match
0.01-5.00%	na	25%	75%
5.01%+	na	75%	25%

For workers who do not contribute toward their 401(k) plan, we assume an employer contribution rate of 5 percent of salary.

Non-401(k) Plans

We also used the SCF to examine employee and employer contribution rates for non-401(k) contribution plans. Similar to our findings for 401(k) plans, we found that employer match rates for non-401(k) plans vary by the worker contribution rate. Accordingly, we vary employer match rates by the worker contribution rate. For those cases where we do not know whether the employer contributes, we randomly assign employer match rates based on the following distribution:

Table 3-8
Distribution of Workers by Employer Match Rate

Worker Contribution Rate	0% Match	50% Match	100% Match
0.01-4.00%	25%	25%	50%
4.01-8.00%	10%	40%	50%
8.01%+	40%	40%	20%

For those cases where we know whether the employer contributes, we randomly assign employer match rates to those workers whose employer contributes using the following distribution:

Table 3-9
Distribution of Workers by Employer Match Rate

Worker Contribution Rate	0% Match	50% Match	100% Match
0.01-4.00%	na	33%	67%
4.01-8.00%	na	44%	56%
8.01%+	na	67%	33%

For workers who do not contribute to their non-401(k) DC plan, we assume an employer contribution rate of 4.5 percent of salary.

3. Rate of Return on Account Balances

We assume that account balances reported at the time of the SIPP survey are allocated evenly between stocks and bonds and also that new contributions are allocated evenly between stocks and bonds. Based on input from ORES, we assume a CPI growth rate of 3.50 percent, a real rate of return for stocks of 6.98 percent, and a real rate of return for bonds of 3.00 percent. We subtract one percent from each of the stock and bond real rates of return to reflect administrative costs. This is the same administrative fee assumption used in the Advisory Council report for the intermediate return PSA-401(k) plan (1997, vol. 1, page 171). (The pension module programs are structured so that the rates of return can be easily modified.) We apply the stock rate of return to the stock allocations and the bond rate of return to the bond allocations. We vary the investment experience by individual and by year by setting the rates stochastically (i.e., drawing them from a normal distribution). Based on recommendations from RAND, we assume a standard deviation of 17.28 percent for stocks and 2.14 percent for bonds.

4. Annuitization Assumptions

Upon reaching age 62 (67), we calculate annuitized account balances for everyone. These annuitized benefits represent the annual benefits available if the workers choose to annuitize, and therefore, are merely illustrative. When projecting income in the years past age 62 and 67, DC pension wealth is included with non-pension wealth and the decline in wealth is estimated by age. See Chapter 7 of this report for more detail on how wealth and income is projected past ages 62 and 67.

We produce two sets of annuitized benefits. The first set uses unisex mortality assumptions based on the 1989-1991 Decennial Life Tables, as published by the NCHS. Presumably, these would be the rates appropriate under a mandated annuitization scenario. The code has the ability to reduce benefits by a loading factor, which is currently set at 20 percent.

The second set uses mortality assumptions developed by RAND and based on PSID data corrected for differences between the PSID and Vital Statistics. These mortality rates vary by gender, birth year, race, and education. The idea here is that we are simulating withdrawals from the account balance rather than assuming the people actually use their account balances to purchase annuities. However, because we assume that people are risk averse, we assume that people will withdraw less from their DC account in order to save in case they live longer than they expect. Therefore, we reduce the annualized benefit that results from the annuity factor calculations by 20 percent to reflect this risk aversion. The annuity program was written such that this reduction factor can be easily modified.

Regardless of which set of assumptions are used, the estimates of annuitized benefits reflect joint and survivor annuities for married persons. The amount payable to the survivor is currently set at 50 percent, but can easily be modified.

5. Transfer of Account Balances to Widow(er)s

We transfer the account balances of workers who die prior to age 62 (67) to their surviving spouses. The account balances continue to accrue interest until the surviving spouse attains age 62 (67), but no additional contributions are made. When the surviving spouse attains age 62 (67), the account balance is annuitized. If the surviving spouse is already age 62 (67) or older, we annuitize the balance as of the date of the worker's death.

IV. INCREASING FUTURE DB AND DC PENSION PLAN PARTICIPATION

Some workers who are not currently covered by a pension plan (either because they are not participating or their employer does not offer a pension) will move into DB or DC pension plans over time. In particular, pension plan participation increases with age (up to age 50 or so) and with earnings. We randomly increase future pension participation so that it incorporates current trends in pension participation by age and earnings.

Using data from the 1990-1993 SIPP, we created the following matrices of pension plan participation rates by age, gender, and income quintile (determined by gender).

Over time, workers move from one participation rate cell to another as they age and possibly earn more income. As non-participating workers move from one cell to another, we randomly assign them to pension plans such that the overall participation rate for the cell is preserved. (Since we increase pension coverage among nonparticipants only, we avoid having to address whether new coverage replaces or supplements already existing coverage.)

Table 3-10
Pension Plan Participation Rates

	Earnings Quintile				
	First	**Second**	**Third**	**Fourth**	**Fifth**
			Men		
Age 30-32	19	34	51	62	68
Age 33-37	28	45	62	72	78
Age 38-42	35	53	69	78	83
Age 43-47	39	57	73	81	86
Age 48-52	42	60	75	83	87
Age 53-57	41	58	74	82	86
Age 58-62	35	53	69	78	83
			Women		
Age 30-32	15	25	43	59	68
Age 33-37	22	33	53	68	76
Age 38-42	25	38	57	72	80
Age 43-47	28	41	60	75	82
Age 48-52	26	39	58	73	81
Age 53-57	25	37	56	72	79
Age 58-62	22	33	53	69	77

We use the following formula to assign pension plan coverage to non-participating workers:

$$\frac{(\text{participation rate}_{\text{age in x years, earnings quintile in x years}} - \text{participation rate}_{\text{current age and earnings quintile}})}{(100\text{-participation rate}_{\text{current age and earnings quintile}})}$$

where current age and earnings quintile are those as of the time of the SIPP survey.

For instance, 45 percent of 35 year old working men with earnings in the second quintile participate in a pension plan. This means that 55 percent do not participate. If in five years, however, the workers who did not participate had earnings in the third quintile and are now age 40, they are now included with the group that participates at a rate of 69 percent. Therefore, (69-45)/55=44% of these workers would become new pension participants at age 40.

We compare participation rates in five year intervals until the worker reaches age 53 or older. In other words, a 35 year old who is not participating at the time of the SIPP survey first has the opportunity to newly participate in a pension plan at age 40. If we do not assign coverage at age 40, the worker has another opportunity to newly participate at age 45, and then again at age 50.

Note that we do not include any explicit cohort effects in assigning participation rates. In other words, we assume that current 35 year olds will have the same participation rate at age 50 as current 50 year olds in the same position in the earnings distribution. However, the future pension participation rates of more recent cohorts will differ from those of current older cohorts to the extent that their earnings distributions differ.

Consistent with current trends in pension plan coverage, we assume that two-thirds of new pension participants join DC plans and one-third join DB plans. (This assumption can be easily modified within the pension module.)

It is also possible that individuals who are not working at the time of the SIPP survey eventually enter the labor force and participate in an employment-based pension plan. To allow for this possibility, we apply the rates in the above pension participation matrix to those individuals who according to the earnings projections, enter the work force. Take for example, a woman who is not working at age 33 but subsequently enters the labor force at age 38. We assign her a 38 percent probability of having pension coverage, the same probability as similarly situated women. Again, we assume that two-thirds of new participants join DC plans and one-third join DB plans.

V. RESULTS

Tables 3-11 through 3-24 summarize the output of the pension module. Tables 3-11 and 3-12 present the coverage rates and mean balance and benefit amounts by various characteristics for the age 62 and age 67 scenarios, respectively. Tables 3-13 through 3-17 present coverage rates by birth cohort, AIME quintile, gender, and retirement age scenario. Table 3-18 presents the mean DB benefits by birth cohort, AIME quintile, gender, and age retirement age scenario. Similarly, Tables 3-19 through 3-21 present mean DC balances and annuitized benefits, and Tables 3-22 through 3-24 present mean IRA balances and annuitized benefits.

Note that under the age 62 scenario, all benefit coverage percentages and mean balance and benefit amounts reflect coverage and amounts at age 62 assuming retirement and annuitization by age 62. Similarly, under the age 67 scenario, all benefit coverage percentages and mean balance and benefit amounts reflect coverage and amounts at age 67 assuming retirement and annuitization by age 67. In these tables, mean balances and benefits reflect those for persons with coverage only.

1. Pension Coverage

The left panel of Table 3-11 presents pension coverage rates under the retirement age 62 scenario. Coverage rates represent the proportion of people in the SIPP sample who will receive pension benefits at age 62. Forty-seven percent have pension coverage from a DB or DC

(including Keoghs) plan. In addition, 20 percent have IRA coverage. Overall, 62 percent have pension coverage from any source at age 62 (including DB, DC, and IRA coverage).

The *Income of the Aged Chartbook, 1996* (SSA ORES, 1998, p. 8) shows that 41 percent of aged units receive retirement benefits other than Social Security (includes private pensions and annuities, government employee pensions, railroad retirement, and IRA, Keogh, and 401(k) payments). Our percentages are higher by about 20 percentage points, presumably because we include all persons with DC and IRA account balances, regardless of whether they will actually receive annuitized benefits. (Note also that the *Chartbook* uses aged units, whereas we look at persons.)

The left panel of Table 3-12 presents pension coverage rates under the retirement age 67 scenario. The overall proportion of persons receiving pension income is slightly higher under the age 67 scenario; overall coverage rates including IRA coverage are 63 percent under the age 67 scenario and 62 percent under the age 62 scenario. However, coverage for each type of plan is lower under the age 67 scenario. For example, DB coverage is 35 percent under the age 62 scenario and 33 percent under the age 67 scenario. This suggests that there are fewer people with multiple plan types under the age 67 scenario then there are under the age 62 scenario.

Regardless of the retirement age scenario used, some pension coverage patterns emerge. Although overall coverage rates are roughly similar by birth cohort, overall rates mask the differences by plan type. For instance, IRA coverage is lower among more recent cohorts, primarily because we have chosen not to assign future IRA coverage to those not currently participating in an IRA plan. However, since those with IRA coverage typically also have either DB or DC coverage, this does not change overall coverage rates by cohort. In addition, DB coverage decreases and DC coverage increases among more recent cohorts. This results, in part, from our assumptions regarding new coverage. Our future pension participation module assumes that two-thirds of new pension plan participants are in a DC plan. We feel this is appropriate given current trends in plan types.

Pension coverage increases with lifetime income, as measured by one's AIME as a portion of national average wages in the year one turns age 62 (67). Persons in the highest AIME quintile have pension coverage rates over twice those in the first quintile. In addition, men are more likely to have pension coverage than women, although participation in IRAs is nearly identical. Pension coverage is higher for married persons, those with more education, and whites and non-Hispanics.

Table 3-11
Pension Coverage Rates and Mean Benefits and Balances, Age 62 Scenario

	Coverage					Benefit and Balance Means (as a percentage of average national wage)						
			Employment-Based									
	DB, DC, or IRA	IRA	DB or DC	DB	DC	DB Benefit	DC Balance	DC Benefit (unisex mort)	DC Benefit (indiv mort)	IRA Balance	IRA Benefit (unisex mort)	IRA Benefit (indiv mort)
ALL	61.5%	20.2%	47.2%	34.6%	21.0%	0.281	5.671	0.444	0.403	1.411	0.110	0.100
AIME Quintile												
Quintile 1	37.0	13.7	25.6	21.3	7.6	0.386	4.155	0.325	0.292	0.882	0.069	0.062
Quintile 2	45.0	14.2	32.1	24.8	10.8	0.153	2.783	0.218	0.196	1.443	0.112	0.101
Quintile 3	61.5	15.3	47.6	33.8	19.7	0.168	3.032	0.239	0.217	1.494	0.117	0.106
Quintile 4	75.9	22.1	59.8	42.4	27.2	0.246	4.801	0.377	0.343	1.490	0.117	0.106
Quintile 5	88.2	35.8	70.8	50.5	39.8	0.406	8.699	0.679	0.618	1.514	0.118	0.107
Birth Cohort												
<1931	59.5	32.4	45.6	41.6	7.4	0.474	1.653	0.127	0.119	0.008	0.001	0.001
1931-1935	62.5	32.8	46.5	39.0	15.6	0.416	2.298	0.177	0.166	0.119	0.009	0.009
1936-1940	62.4	27.8	45.2	34.6	20.6	0.355	3.263	0.251	0.235	0.522	0.040	0.038
1941-1945	63.2	24.7	46.9	34.8	22.7	0.294	4.451	0.346	0.317	1.012	0.079	0.072
1949-1950	64.7	22.1	49.2	35.6	24.1	0.265	5.598	0.436	0.398	1.619	0.126	0.114
1951-1955	62.5	17.9	47.8	33.5	23.8	0.230	6.181	0.484	0.440	2.342	0.183	0.166
1956-1960	60.6	13.5	47.5	32.6	22.9	0.199	7.543	0.592	0.534	3.114	0.242	0.219
1961-1965	57.6	8.3	46.7	30.9	21.9	0.174	7.030	0.555	0.498	3.609	0.284	0.255
Gender												
Female	57.2	19.8	44.8	32.8	19.2	0.216	4.983	0.394	0.344	1.466	0.116	0.102
Male	66.5	20.6	49.6	36.4	22.9	0.341	6.276	0.487	0.455	1.355	0.105	0.098
Marital Status												
Single	60.2	13.8	39.1	29.4	17.0	0.258	5.982	0.466	0.419	1.777	0.138	0.123
Married	62.1	24.1	52.1	37.8	23.5	0.292	5.531	0.434	0.396	1.281	0.100	0.092
Education												
HS dropout	37.0	6.2	28.4	22.5	8.4	0.188	2.595	0.202	0.203	0.513	0.040	0.040
HS grad	60.2	17.5	46.3	34.2	19.9	0.246	4.710	0.369	0.340	1.310	0.102	0.094
College	78.5	34.9	60.6	42.7	31.1	0.376	7.624	0.596	0.531	1.627	0.127	0.113
Race												
White	63.2	22.3	48.0	35.0	21.8	0.287	5.790	0.453	0.411	1.396	0.109	0.099
Black	51.0	5.5	42.3	33.2	15.2	0.246	4.211	0.330	0.310	1.639	0.128	0.120
Native	52.6	9.3	42.9	32.3	16.2	0.206	4.066	0.318	0.289	1.240	0.096	0.087
Asian	54.3	17.1	42.7	29.8	20.4	0.235	6.403	0.503	0.453	1.667	0.130	0.117
Hispanic												
No	63.1	21.4	48.3	35.4	21.7	0.285	5.723	0.448	0.407	1.410	0.110	0.100
Yes	43.1	6.4	34.9	25.1	13.8	0.208	4.766	0.373	0.345	1.448	0.113	0.103
Pension Type												
No pension	-	-	-	-	-	na	na	na	na	na	na	na
IRA only	100.0	100.0	-	-	-	na	na	na	na	1.102	0.087	0.079
DC only	100.0	-	100.0	-	100.0	na	5.408	0.426	0.388	na	na	na
DC and IRA	100.0	100.0	100.0	-	100.0	na	7.457	0.585	0.523	2.050	0.158	0.144
DB only	100.0	-	100.0	100.0	-	0.234	na	na	na	na	na	na
DB and IRA	100.0	100.0	100.0	100.0	-	0.369	na	na	na	1.131	0.088	0.080
DB and DC	100.0	-	100.0	100.0	100.0	0.289	4.529	0.352	0.324	na	na	na
DB DC and IRA	100.0	100.0	100.0	100.0	100.0	0.393	6.139	0.476	0.432	1.872	0.146	0.131
SIPP Wave												
1990	61.0	19.7	46.2	32.1	22.2	0.278	6.069	0.475	0.431	1.650	0.129	0.117
1991	62.6	20.0	47.8	36.2	19.5	0.277	5.082	0.397	0.362	1.457	0.113	0.103
1992	62.5	20.1	49.0	37.7	19.3	0.274	5.181	0.406	0.369	1.418	0.111	0.100
1993	59.9	20.9	45.6	32.3	23.0	0.296	6.194	0.484	0.440	1.133	0.089	0.080

Note:
1. AIME Quintile Breaks are: 0.192, 0.498, 0.836, and 1.273 times the national average wage.

Table 3-12
Pension Coverage Rates and Mean Benefits and Balances, Age 67 Scenario

	Coverage					Benefit and Balance Means (as a proportion of average national wage)						
			Employment-Based			DB Benefit	DC Balance	DC Benefit (unisex mort)	DC Benefit (indiv mort)	IRA Balance	IRA Benefit (unisex mort)	IRA Benefit (indiv mort)
	DB, DC, or IRA	IRA	DB or DC	DB	DC							
ALL	62.5%	19.2%	44.7%	32.9%	19.9%	0.258	7.391	0.648	0.569	2.052	0.180	0.157
AIME Quintile												
Quintile 1	38.5	13.4	25.5	21.3	7.7	0.380	6.085	0.534	0.462	1.446	0.128	0.110
Quintile 2	45.6	13.3	30.8	24.1	10.1	0.144	3.723	0.327	0.280	2.018	0.179	0.153
Quintile 3	63.2	14.8	46.5	33.2	19.5	0.155	4.232	0.373	0.325	2.222	0.196	0.170
Quintile 4	76.9	21.2	56.0	40.0	25.5	0.219	6.324	0.557	0.490	2.223	0.195	0.171
Quintile 5	88.4	32.5	63.2	45.3	35.7	0.369	11.078	0.968	0.853	2.118	0.185	0.162
Birth Cohort												
<1931	61.8	31.9	44.3	40.3	7.6	0.416	2.545	0.221	0.196	0.162	0.014	0.013
1931-1935	64.5	30.7	43.2	36.4	14.8	0.379	3.866	0.337	0.304	0.543	0.048	0.043
1936-1940	63.5	26.0	43.0	33.4	19.6	0.343	4.714	0.407	0.368	1.051	0.092	0.082
1941-1945	64.0	23.5	44.2	32.9	21.4	0.276	6.129	0.532	0.474	1.615	0.141	0.125
1949-1950	65.4	20.9	46.4	33.9	22.7	0.249	7.255	0.632	0.559	2.348	0.206	0.179
1951-1955	63.2	16.9	45.1	31.9	22.3	0.213	7.905	0.694	0.610	3.255	0.286	0.247
1956-1960	61.2	12.8	45.0	31.1	21.7	0.181	9.486	0.833	0.727	4.118	0.362	0.312
1961-1965	58.3	7.9	44.3	29.5	20.6	0.157	9.012	0.800	0.688	4.529	0.402	0.344
Gender												
Female	58.6	19.4	44.4	32.8	19.1	0.205	6.741	0.599	0.500	2.252	0.200	0.168
Male	67.4	18.9	44.9	33.1	20.7	0.314	8.017	0.695	0.635	1.836	0.159	0.145
Marital Status												
Single	61.7	12.9	35.1	26.6	15.2	0.242	7.807	0.678	0.587	2.619	0.228	0.194
Married	62.9	24.4	52.6	38.2	23.8	0.267	7.169	0.632	0.559	1.801	0.159	0.140
Education												
HS dropout	38.2	5.9	26.2	20.9	7.7	0.170	3.428	0.297	0.294	0.814	0.071	0.070
HS grad	61.1	16.7	43.9	32.7	18.9	0.227	6.061	0.532	0.475	1.894	0.167	0.148
College	78.8	32.9	57.5	40.8	29.5	0.344	10.025	0.879	0.753	2.374	0.208	0.177
Race												
White	64.2	21.2	45.5	33.3	20.7	0.264	7.554	0.662	0.580	2.041	0.179	0.156
Black	52.2	5.3	39.9	31.3	14.3	0.228	5.388	0.474	0.433	2.224	0.195	0.179
Native	53.5	8.1	39.7	30.7	13.9	0.200	5.230	0.461	0.410	1.885	0.163	0.142
Asian	55.4	16.1	40.7	28.7	19.1	0.223	8.298	0.732	0.634	2.220	0.195	0.168
Hispanic												
No	64.1	20.3	45.7	33.8	20.5	0.262	7.445	0.653	0.572	2.049	0.180	0.157
Yes	44.3	6.2	32.8	23.7	13.0	0.196	6.448	0.563	0.505	2.130	0.187	0.165
Pension Type												
No pension	-	-	-	-	-	na	na	na	na	na	na	na
IRA only	100.0	100.0	-	-	-	na	na	na	na	1.570	0.139	0.122
DC only	100.0	-	100.0	-	100.0	na	6.919	0.608	0.539	na	na	na
DC and IRA	100.0	100.0	100.0	-	100.0	na	9.723	0.852	0.741	2.826	0.248	0.215
DB only	100.0	-	100.0	100.0	-	0.214	na	na	na	na	na	na
DB and IRA	100.0	100.0	100.0	100.0	-	0.334	na	na	na	1.605	0.141	0.124
DB and DC	100.0	-	100.0	100.0	100.0	0.264	5.823	0.511	0.452	na	na	na
DB DC and IRA	100.0	100.0	100.0	100.0	100.0	0.371	8.322	0.728	0.628	2.931	0.257	0.220
SIPP Wave												
1990	62.1	18.5	43.5	30.6	20.8	0.255	7.890	0.693	0.608	2.396	0.211	0.183
1991	63.8	19.2	45.2	34.4	18.4	0.253	6.823	0.598	0.525	2.001	0.176	0.153
1992	63.4	19.2	46.6	36.0	18.4	0.255	6.808	0.597	0.524	2.145	0.188	0.164
1993	60.8	19.8	43.3	30.9	21.9	0.270	7.883	0.691	0.606	1.689	0.149	0.129

Note:
1. AIME Quintile Breaks are: 0.192, 0.498, 0.836, and 1.273 times the national average wage.

Table 3-13 through 3-17 present coverage rates (DB/DC/IRA, IRA, DB/DC, DB, and DC) by birth cohort, gender, AIME quintile, and retirement age scenario. Among women, the percentage with pension coverage from any source (including IRAs) remains fairly steady across cohorts (Table 3-13). However, an interesting trend emerges when examining the percentage of women with either DB or DC coverage (Table 3-14). Although coverage rates by birth cohort remain fairly steady within AIME quintiles, coverage rates increase for more recent cohorts in the aggregate. This likely reflects a shift in the distribution of women by AIME quintile; women in more recent birth cohorts are more likely to be in higher AIME quintiles, and therefore are more likely to have pension coverage. This trend is consistent with Johnson (1999), who concludes that the gender gap in pension coverage is due primarily to gender differences in income.

Among men, the percentage with pension coverage from any source (including IRAs) decreases slightly, both within AIME quintiles and overall (Table 3-13). Decreases within the lowest two AIME quintiles are more dramatic than those in the higher AIME quintile, suggesting that low lifetime earners in more recent cohorts are relatively worse off than low lifetime earners in older cohorts. Similar trends are evident when examining the percentage of men with either DB or DC coverage (Table 3-14).

When examining DB coverage in particular, coverage rates hold steady for women by birth cohort (although in general, rates decrease by cohort within AIME quintiles) and decrease for men by birth cohort, both within AIME quintiles and overall (Table 3-15). DC coverage rates increase by cohort, for both men and women, both overall and within AIME quintiles (Table 3-16). Again, however, these trends in overall coverage rates by coverage type reflect our assumption that two-thirds of new pension participants will be in DC plans. Finally, IRA coverage decreases by birth cohort for both women and men, both within AIME quintiles and overall, reflecting that we do not assign future IRA coverage to those not currently participating in an IRA plan (Table 3-17).

2. DB Benefits

The right panels of Tables 3-11 and 3-12 present the mean benefits and balances for the various pension types. Note again that means are for those with coverage only. Mean DB benefits are 0.28 times and 0.26 times the national average salary, under the age 62 and age 67 scenarios, respectively. Benefits are slightly lower under the age 67 scenario because workers are more likely to leave their job prior to age 67 than they are to leave prior to age 62. Because final salaries used in DB benefit computations are not indexed, leaving a job prior to age 62 (67) will result in lower benefits.

In general, patterns of DB benefits are similar to those in pension plan coverage. Among those receiving DB benefits, average DB benefits are higher among men, married persons, more educated persons, whites, and non-hispanics. Although DB benefits increase from AIME

Table 3-13
Percentage with DB, DC, or IRA Coverage

Percentage with DB, DC, or IRA Coverage at 62, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	62	59	62	62	63	65	63	61	58
	AIME Quintile									
	Quintile 1	37	39	41	39	38	40	37	32	30
	Quintile 2	45	54	52	50	48	45	39	42	41
	Quintile 3	61	61	67	64	63	62	63	61	57
	Quintile 4	76	77	73	73	75	79	78	76	74
	Quintile 5	88	90	89	89	89	90	88	87	85
Female	ALL	57	50	56	56	58	60	59	58	57
	AIME Quintile									
	Quintile 1	34	36	38	35	34	35	34	32	29
	Quintile 2	48	56	54	52	53	48	43	43	42
	Quintile 3	70	71	78	77	71	71	69	68	65
	Quintile 4	84	87	88	84	87	87	84	82	78
	Quintile 5	90	92	89	93	91	92	89	89	89
Male	ALL	66	70	70	70	69	70	67	64	59
	AIME Quintile									
	Quintile 1	47	54	58	60	54	55	43	32	35
	Quintile 2	38	46	47	42	36	34	30	41	39
	Quintile 3	50	50	52	46	49	48	54	52	47
	Quintile 4	71	75	68	68	68	72	74	71	70
	Quintile 5	88	90	89	88	89	89	88	86	83

Percentage with DB, DC, or IRA Coverage at 67, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	63	62	65	64	64	65	63	61	58
	AIME Quintile									
	Quintile 1	38	41	44	42	40	41	38	33	32
	Quintile 2	46	56	53	50	49	45	40	42	42
	Quintile 3	63	63	70	65	64	64	64	63	59
	Quintile 4	77	77	75	75	76	80	79	77	75
	Quintile 5	88	91	89	89	90	90	88	87	85
Female	ALL	59	53	58	58	59	61	60	59	58
	AIME Quintile									
	Quintile 1	36	37	41	37	36	36	35	33	30
	Quintile 2	48	58	54	52	53	49	44	43	43
	Quintile 3	71	74	79	76	71	72	71	70	67
	Quintile 4	84	86	89	85	86	87	84	82	80
	Quintile 5	90	95	91	93	91	92	90	89	87
Male	ALL	67	72	72	71	70	70	67	64	59
	AIME Quintile									
	Quintile 1	49	58	60	62	56	56	46	34	38
	Quintile 2	38	48	50	43	35	33	29	40	39
	Quintile 3	52	49	55	46	51	51	55	55	49
	Quintile 4	72	75	69	70	69	74	75	72	70
	Quintile 5	88	91	89	88	90	89	88	85	83

Table 3-14
Percentage with DB or DC Coverage

Percentage with DB or DC Coverage at 62, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	47	46	47	45	47	49	48	47	47
	AIME Quintile									
	Quintile 1	26	25	25	24	25	29	27	25	24
	Quintile 2	32	40	37	35	32	31	27	31	32
	Quintile 3	48	50	52	46	48	48	48	48	45
	Quintile 4	60	63	57	54	59	60	61	61	61
	Quintile 5	71	74	73	71	69	71	70	70	72
Female	ALL	45	35	39	40	43	48	47	48	49
	AIME Quintile									
	Quintile 1	23	20	20	19	21	25	26	25	24
	Quintile 2	34	40	36	36	35	34	31	33	34
	Quintile 3	57	56	62	59	56	58	56	58	56
	Quintile 4	72	73	76	70	75	75	72	72	70
	Quintile 5	80	86	78	80	78	82	79	78	82
Male	ALL	50	58	55	51	51	51	48	47	45
	AIME Quintile									
	Quintile 1	35	50	47	46	40	42	30	24	26
	Quintile 2	27	39	39	30	25	23	20	27	29
	Quintile 3	36	43	39	30	35	34	37	37	35
	Quintile 4	53	62	51	47	50	51	54	53	54
	Quintile 5	68	73	73	70	67	68	67	67	67

Percentage with DB or DC Coverage at 67, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	45	44	43	43	44	46	45	45	44
	AIME Quintile									
	Quintile 1	26	24	25	25	25	29	27	24	25
	Quintile 2	31	40	33	33	31	29	26	30	32
	Quintile 3	47	48	50	44	46	46	47	48	45
	Quintile 4	56	58	52	51	55	57	57	57	56
	Quintile 5	63	69	63	63	62	64	63	63	63
Female	ALL	44	36	39	40	43	47	47	47	48
	AIME Quintile									
	Quintile 1	23	20	22	21	22	25	26	25	24
	Quintile 2	34	40	33	35	34	33	31	32	35
	Quintile 3	57	56	59	56	56	58	56	58	56
	Quintile 4	69	71	72	66	70	71	69	69	68
	Quintile 5	76	80	75	77	75	77	76	74	78
Male	ALL	45	54	48	46	46	46	44	43	40
	AIME Quintile									
	Quintile 1	33	48	39	43	37	37	30	22	25
	Quintile 2	25	37	33	28	22	20	17	25	27
	Quintile 3	34	37	37	28	32	32	37	37	34
	Quintile 4	48	55	44	44	46	48	49	48	47
	Quintile 5	60	68	62	61	59	60	58	58	56

Table 3-15
Percentage with DB Coverage

Percentage with DB Coverage at 62, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	35	42	39	35	35	36	34	33	31
	AIME Quintile									
	Quintile 1	21	23	22	20	20	24	22	20	20
	Quintile 2	25	36	30	27	24	22	20	24	25
	Quintile 3	34	45	43	34	34	33	33	32	30
	Quintile 4	42	58	47	41	43	42	41	40	37
	Quintile 5	51	65	60	53	51	51	48	46	44
Female	ALL	33	32	32	30	32	35	34	34	33
	AIME Quintile									
	Quintile 1	19	19	17	15	17	20	21	20	20
	Quintile 2	26	36	29	27	26	24	22	26	25
	Quintile 3	40	50	51	42	42	39	38	38	37
	Quintile 4	50	66	61	53	52	54	49	48	43
	Quintile 5	56	78	60	63	56	63	55	52	51
Male	ALL	36	53	47	39	38	37	33	31	29
	AIME Quintile									
	Quintile 1	29	48	43	39	32	34	24	19	19
	Quintile 2	22	36	35	25	19	17	15	20	23
	Quintile 3	26	40	33	24	24	25	26	26	23
	Quintile 4	38	57	43	36	38	35	35	34	33
	Quintile 5	49	65	61	52	50	48	46	44	41

Percentage with DB Coverage at 67, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	33	40	36	33	33	34	32	31	29
	AIME Quintile									
	Quintile 1	21	23	21	21	20	23	22	20	20
	Quintile 2	24	36	28	26	23	22	20	23	24
	Quintile 3	33	43	42	33	34	32	33	32	29
	Quintile 4	40	53	43	40	41	41	39	38	35
	Quintile 5	45	62	52	48	45	46	43	41	39
Female	ALL	33	32	32	31	32	34	33	33	33
	AIME Quintile									
	Quintile 1	19	19	18	18	18	21	21	20	20
	Quintile 2	26	36	28	27	25	24	23	25	26
	Quintile 3	40	49	49	41	43	39	39	38	37
	Quintile 4	49	63	58	52	47	50	49	47	43
	Quintile 5	53	71	56	60	55	59	52	49	48
Male	ALL	33	50	41	36	34	33	30	29	26
	AIME Quintile									
	Quintile 1	27	46	36	37	29	30	23	17	19
	Quintile 2	20	35	29	23	17	16	13	18	22
	Quintile 3	25	35	31	22	21	23	26	26	22
	Quintile 4	35	51	38	34	37	34	33	31	29
	Quintile 5	43	61	52	46	43	43	40	38	35

Table 3-16
Percentage with DC Coverage

Percentage with DC Coverage at 62, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	21	7	16	21	23	24	24	23	22
	AIME Quintile									
	Quintile 1	8	3	6	8	9	11	9	8	6
	Quintile 2	11	7	12	14	13	12	11	10	9
	Quintile 3	20	8	17	21	22	22	21	20	20
	Quintile 4	27	10	18	24	27	30	31	31	32
	Quintile 5	40	17	31	38	40	40	42	44	45
Female	ALL	19	5	13	18	20	23	23	22	21
	AIME Quintile									
	Quintile 1	6	2	5	6	7	9	8	7	6
	Quintile 2	12	6	12	15	14	13	13	10	10
	Quintile 3	25	10	21	29	25	28	26	26	25
	Quintile 4	36	17	27	34	40	41	37	36	37
	Quintile 5	47	16	39	41	47	45	50	49	50
Male	ALL	23	10	19	24	26	25	25	24	22
	AIME Quintile									
	Quintile 1	12	5	8	19	17	16	13	10	8
	Quintile 2	9	7	11	9	11	8	8	10	8
	Quintile 3	14	5	10	11	17	14	15	14	15
	Quintile 4	22	8	15	19	20	24	27	27	28
	Quintile 5	38	17	31	38	39	39	40	42	43

Percentage with DC Coverage at 67, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	20	8	15	20	21	23	22	22	21
	AIME Quintile									
	Quintile 1	8	3	6	9	9	10	9	8	6
	Quintile 2	10	6	10	13	12	11	10	10	9
	Quintile 3	20	8	16	20	21	22	21	20	20
	Quintile 4	25	10	17	22	25	29	28	29	29
	Quintile 5	36	15	28	34	37	37	39	39	40
Female	ALL	19	6	13	17	19	22	22	21	21
	AIME Quintile									
	Quintile 1	7	3	6	6	8	9	8	7	5
	Quintile 2	11	6	10	14	13	12	12	10	11
	Quintile 3	25	11	20	28	25	28	26	26	24
	Quintile 4	34	18	27	30	37	38	35	34	35
	Quintile 5	46	20	40	43	46	44	49	47	48
Male	ALL	21	9	17	22	23	23	22	22	20
	AIME Quintile									
	Quintile 1	11	5	7	18	16	14	12	10	9
	Quintile 2	8	6	9	8	10	6	6	9	7
	Quintile 3	13	4	11	10	16	14	15	14	15
	Quintile 4	20	8	13	19	18	22	24	25	25
	Quintile 5	33	15	27	33	35	35	35	36	36

Table 3-17
Percentage with IRA Coverage

Percentage with IRA Coverage at 62, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	20	32	33	28	25	22	18	13	8
	AIME Quintile									
	Quintile 1	14	23	24	20	16	13	10	6	3
	Quintile 2	14	28	27	23	19	15	11	9	4
	Quintile 3	15	27	30	24	21	16	14	10	7
	Quintile 4	22	38	32	30	26	24	20	16	10
	Quintile 5	36	63	56	44	40	37	33	26	20
Female	ALL	20	29	31	28	24	22	18	14	8
	AIME Quintile									
	Quintile 1	14	23	24	19	16	14	10	6	3
	Quintile 2	17	31	29	26	22	18	13	10	5
	Quintile 3	20	35	40	33	26	21	17	12	8
	Quintile 4	27	53	48	44	35	32	25	19	12
	Quintile 5	36	66	55	50	43	41	38	34	23
Male	ALL	21	36	35	28	26	22	18	13	8
	AIME Quintile									
	Quintile 1	12	22	26	22	17	13	9	4	2
	Quintile 2	8	16	20	11	10	10	5	7	3
	Quintile 3	9	18	16	14	13	9	9	7	5
	Quintile 4	20	35	27	24	21	18	17	14	9
	Quintile 5	36	63	56	43	39	36	31	24	18

Percentage with IRA Coverage at 67, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	19	32	31	26	24	21	17	13	8
	AIME Quintile									
	Quintile 1	13	22	24	19	16	13	9	6	3
	Quintile 2	13	25	25	21	18	15	11	8	4
	Quintile 3	15	28	27	22	20	16	13	10	6
	Quintile 4	21	36	31	29	26	23	19	15	10
	Quintile 5	32	58	48	38	36	34	30	24	18
Female	ALL	19	29	30	27	23	22	18	13	8
	AIME Quintile									
	Quintile 1	14	22	24	19	16	13	10	6	3
	Quintile 2	16	29	27	24	22	17	14	10	5
	Quintile 3	20	37	36	31	25	20	17	12	8
	Quintile 4	26	50	47	42	34	31	23	18	11
	Quintile 5	35	57	52	47	39	40	36	32	23
Male	ALL	19	35	31	25	24	20	16	12	7
	AIME Quintile									
	Quintile 1	11	22	23	21	15	13	9	5	2
	Quintile 2	7	14	18	11	9	8	4	6	2
	Quintile 3	9	16	15	11	14	9	9	7	5
	Quintile 4	18	32	24	23	21	17	16	13	9
	Quintile 5	32	58	48	37	35	32	27	21	15

quintile two up to AIME quintile five, average DB benefits for those in the lowest AIME quintile are nearly that of those in the highest AIME quintile. This counterintuitive result might be caused, in part, by workers who are not covered by Social Security. These noncovered workers will have an AIME of zero, but will actually have nonzero lifetime earnings, and since they are most likely to be government workers, they will have generous DB benefits. This could be artificially increasing the mean benefits of those in AIME quintile one. Average DB benefits among those receiving benefits decrease by birth cohort, for both women and men, within AIME quintiles and overall (Table 3-18).

Average DB benefits are lower among more recent cohorts, which likely reflects the method of projecting earnings. Earnings are projected based on a single-equation approach (using earnings of persons reporting both positive earnings as well as those with zero earnings in given years) rather than a two-equation approach (the first equation estimates whether individuals have positive covered earnings; the second estimates the level of earnings for those with earnings). As a result of using the single-equation approach, earnings in later years will be understated for many individuals who continue to work and will be overstated for those who stop working.

Since DB benefits rely on the earnings projections to estimate final salary (defined in the DB pension model as the highest five consecutive years of earnings out of the last 10 years of earnings), any over- or understatements in earnings will affect DB benefit levels. For older workers who continue working, the final salary used in the DB benefit estimation may be too low, and therefore their benefits may be understated. Any understatement of benefits will be concentrated among the more recent cohorts because the potential for understating earnings among older workers increases for more recent cohorts.

For those who left the labor force prior to reaching age 62 or 67, the single-equation approach can result in several years of low, rather than zero, earnings at the end of a worker's career. Although this method may overstate earnings later in life, the final salary may actually be understated because it will reflect the artificially low earnings rather than the actual earnings that preceded labor force departure. Since the single-equation method may overstate the number of years of service, however, it is unclear whether the DB benefits will be over- or understated for those who leave the labor force prior to age 62 or 67.

3. DC Balances and Potential Annuitized Benefits

Average DC balances under the retirement age 62 scenario are 5.67 times the national average wage (Table 3-11, middle panel). There is a 30 percent increase in DC balances from the age 62 scenario to the age 67 scenario, when balances are 7.39 times the national average salary. This is due in part to additional contributions between age 62 and 67. However, it is probably primarily due to our investment assumptions. The combination of a 50 percent stock/50 percent bond allocation of initial account balances and future contributions along with the higher rates of

Table 3-18
DB Benefit

DB Benefit at 62 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.28	0.47	0.42	0.36	0.29	0.27	0.23	0.20	0.17
	AIME Quintile									
	Quintile 1	0.39	0.52	0.50	0.55	0.50	0.42	0.35	0.19	0.09
	Quintile 2	0.15	0.32	0.30	0.21	0.16	0.14	0.09	0.08	0.07
	Quintile 3	0.17	0.36	0.29	0.21	0.16	0.14	0.12	0.12	0.12
	Quintile 4	0.25	0.43	0.37	0.29	0.22	0.21	0.19	0.19	0.19
	Quintile 5	0.41	0.72	0.56	0.48	0.40	0.36	0.34	0.34	0.33
Female	ALL	0.22	0.32	0.28	0.25	0.22	0.22	0.21	0.18	0.16
	AIME Quintile									
	Quintile 1	0.26	0.36	0.33	0.35	0.32	0.28	0.26	0.14	0.08
	Quintile 2	0.11	0.19	0.18	0.13	0.10	0.11	0.09	0.08	0.07
	Quintile 3	0.16	0.29	0.22	0.17	0.15	0.14	0.13	0.13	0.13
	Quintile 4	0.24	0.48	0.41	0.29	0.23	0.21	0.21	0.20	0.20
	Quintile 5	0.40	0.97	0.56	0.55	0.41	0.39	0.39	0.36	0.34
Male	ALL	0.34	0.58	0.52	0.44	0.36	0.31	0.25	0.22	0.19
	AIME Quintile									
	Quintile 1	0.64	0.84	0.84	0.91	0.87	0.63	0.53	0.32	0.11
	Quintile 2	0.26	0.70	0.64	0.46	0.34	0.24	0.08	0.09	0.06
	Quintile 3	0.19	0.47	0.42	0.29	0.18	0.15	0.10	0.10	0.10
	Quintile 4	0.25	0.42	0.35	0.30	0.21	0.20	0.16	0.17	0.18
	Quintile 5	0.41	0.71	0.56	0.47	0.39	0.34	0.33	0.33	0.32

DB Benefit at 67 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.26	0.42	0.38	0.34	0.28	0.25	0.21	0.18	0.16
	AIME Quintile									
	Quintile 1	0.38	0.47	0.48	0.57	0.50	0.43	0.36	0.19	0.09
	Quintile 2	0.14	0.29	0.29	0.20	0.15	0.15	0.09	0.08	0.06
	Quintile 3	0.15	0.31	0.26	0.21	0.16	0.14	0.11	0.11	0.11
	Quintile 4	0.22	0.35	0.34	0.27	0.21	0.19	0.17	0.17	0.17
	Quintile 5	0.37	0.62	0.49	0.43	0.36	0.32	0.31	0.31	0.31
Female	ALL	0.20	0.29	0.27	0.25	0.21	0.21	0.20	0.17	0.15
	AIME Quintile									
	Quintile 1	0.26	0.34	0.34	0.36	0.32	0.28	0.26	0.14	0.08
	Quintile 2	0.11	0.18	0.18	0.13	0.10	0.12	0.09	0.08	0.07
	Quintile 3	0.15	0.24	0.20	0.17	0.14	0.13	0.12	0.12	0.12
	Quintile 4	0.22	0.39	0.35	0.25	0.22	0.19	0.20	0.19	0.19
	Quintile 5	0.37	0.78	0.57	0.46	0.36	0.35	0.36	0.34	0.33
Male	ALL	0.31	0.51	0.47	0.43	0.34	0.29	0.23	0.20	0.16
	AIME Quintile									
	Quintile 1	0.65	0.74	0.83	1.00	0.91	0.70	0.57	0.34	0.11
	Quintile 2	0.24	0.65	0.62	0.46	0.35	0.26	0.08	0.08	0.06
	Quintile 3	0.17	0.43	0.40	0.30	0.19	0.16	0.10	0.08	0.09
	Quintile 4	0.22	0.34	0.33	0.29	0.20	0.19	0.14	0.15	0.15
	Quintile 5	0.37	0.61	0.48	0.43	0.36	0.30	0.29	0.29	0.29

return for stocks means that by the time people reach retirement age, a majority of their account balances are invested in stocks. This, in turn, means that a greater proportion of their accounts receive the higher stock rates of return. In future revisions to this module, it may be preferable to assume periodic portfolio re-balancing.

Regardless of the retirement age scenario, DC balances are higher for men, single persons, more educated persons, whites and Asians, and non-Hispanics. DC balances are somewhat higher for AIME quintile one then for quintile two, and then increase steadily from quintile two through quintile five. DC balances are also higher among younger birth cohorts, primarily because of the stock/bond allocation assumptions mentioned above. More recent cohorts have had more time to accumulate their balances, and therefore, have an even higher proportion of their portfolios invested in stocks (with their higher rate of return) by retirement age than do older cohorts. Thus, in the aggregate, while projected DB benefits among more recent cohorts may be biased downward, there could be an offsetting upward bias in projected DC balances.

We calculated potential annuitized DC benefits per dollar of DC balances using two mortality assumptions. The first assumes a unisex mortality under the 1989-1991 Decennial Life Tables, as published by the NCHS. The second set uses mortality assumptions developed by RAND and based on PSID data corrected for differences between the PSID and Vital Statistics. These mortality rates vary by gender, birth year, race, and education. We refer to these as the group-specific mortality assumptions.

Under the age 62 scenario, average annuitized DC benefits are 0.44 and 0.40 times the national average salary using the unisex and group-specific mortality assumptions, respectively. The benefits under the group-specific mortality assumptions are lower than those under the unisex mortality assumptions because under the group-specific mortality assumptions, mortality is expected to improve over time. The unisex mortality assumptions do not include a cohort effect, resulting in higher mortality rates, and therefore, higher benefits because they are expected to be paid over a shorter period of time.

The use of group-specific annuity rates exacerbates the differences in mean DC benefits by gender. Women's longer life expectancies translate into lower annual benefits. Although use of the group-specific annuity rates appears to narrow the differences in mean DC benefits by education and race, these results might also reflect correlations between education, race, and gender.

Annuitized benefits under the age 67 scenario are greater than those under the age 62 scenario for two reasons. First, the account balances are greater. Second, the shorter life expectancy at age 67 results in higher benefits.

In general, DC balances and annuitized benefits increase for younger birth cohorts for both women and men, both overall and within AIME cohorts (Tables 3-19 through 3-21). As mentioned above, more recent cohorts have more time to accumulate their balances, and therefore, have an even higher proportion of their portfolios invested in stocks (with their higher rate of return) by retirement age than do older cohorts.

4. IRA Balances and Potential Annuitized Benefits

Average IRA balances are only one-quarter of those for DC plans. Average IRA balances are 1.41 and 2.10 times the national average wage under the age 62 and age 67 scenarios, respectively. Similar to the DC balances, there is a large increase from the age 62 scenario to the age 67 scenario, likely due primarily to our investment assumptions.

Potential average IRA annuitized benefits under the age 62 scenario are 0.11 and 0.10 times the national average wage, under the unisex and individual mortality assumptions, respectively. Benefits under the age 67 scenario are almost two-thirds greater, reflecting larger account balances and shorter life expectancies.

IRA balances and annuitized benefits increase for younger birth cohorts for both women and men, both overall and within AIME cohorts (Tables 3-22 through 3-24). This reflects the longer period of time that more recent cohorts can contribute toward their IRA plans.

VI. SUMMARY OF IMPROVEMENTS OVER PREVIOUS MODEL

Much of the pension benefit model builds off of the previous pension model developed as part of the SIPP/DPE model. We enumerate the major improvements to the model below.

1. Replacement Rates by Occupation. The previous pension model varied replacement rates by years of service in the plan, final salary, age at retirement, and sector of employment, but not by occupation. We refined the replacement rates used so that they also account for differences by occupation. For instance, blue collar workers are likely to have flat dollar pension benefits that do not vary by final earnings. Therefore, their replacement rates decrease as final earnings increase. In contrast, white collar workers are more likely to have replacement rates that either do not vary or increase with final earnings.

2. Earnings. Earnings used to calculate DB benefits and those used to calculate DC, Keogh, and IRA contributions reflect the new earnings projections.

Table 3-19
DC Balance

DC Balance at 62 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	5.67	1.65	2.30	3.26	4.45	5.60	6.18	7.54	7.03
	AIME Quintile									
	Quintile 1	4.16	1.54	2.56	3.79	5.23	4.29	5.26	4.74	2.38
	Quintile 2	2.78	1.01	1.38	1.64	2.55	4.51	2.91	3.08	3.01
	Quintile 3	3.03	1.59	1.88	2.23	2.75	2.69	3.03	3.62	3.69
	Quintile 4	4.80	1.72	1.87	3.23	3.26	4.03	4.89	6.59	6.12
	Quintile 5	8.70	2.04	3.09	4.22	6.18	8.37	9.45	11.73	12.08
Female	ALL	4.98	1.90	2.14	2.81	4.03	4.45	5.32	6.77	6.06
	AIME Quintile									
	Quintile 1	3.79	2.18	2.67	3.15	5.23	4.02	3.74	4.79	2.29
	Quintile 2	2.65	0.83	1.35	1.57	2.78	3.57	3.00	3.11	2.91
	Quintile 3	3.08	1.90	2.16	2.31	3.05	2.69	3.13	3.56	3.77
	Quintile 4	5.28	2.86	2.35	4.24	3.76	4.42	5.15	7.33	5.93
	Quintile 5	9.77	6.03	3.60	3.99	6.72	7.63	9.74	12.16	11.79
Male	ALL	6.28	1.49	2.41	3.61	4.79	6.65	6.97	8.25	8.00
	AIME Quintile									
	Quintile 1	4.75	0.22	2.22	4.68	5.23	4.70	7.30	4.66	2.54
	Quintile 2	3.19	1.48	1.47	1.99	1.77	8.69	2.58	3.02	3.20
	Quintile 3	2.93	0.92	1.10	1.94	2.07	2.70	2.84	3.74	3.58
	Quintile 4	4.36	1.27	1.60	2.49	2.73	3.62	4.64	5.87	6.32
	Quintile 5	8.35	1.91	3.05	4.25	6.07	8.61	9.32	11.54	12.24

DC Balance at 67 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	7.39	2.54	3.87	4.71	6.13	7.25	7.91	9.49	9.01
	AIME Quintile									
	Quintile 1	6.08	5.7	4.51	6.11	7.18	6.09	6.93	7.09	2.99
	Quintile 2	3.72	1	2.46	1.94	5.06	4.67	4.02	4.35	3.37
	Quintile 3	4.23	1.64	4.1	2.88	3.79	4.39	4.06	4.96	4.7
	Quintile 4	6.32	2.45	2.92	4.49	4.84	5.71	6.56	7.82	8.07
	Quintile 5	11.08	2.55	4.66	6.24	7.91	10.31	11.79	14.85	16.1
Female	ALL	6.74	3.34	4.1	4.23	5.67	6.26	6.92	8.72	8.04
	AIME Quintile									
	Quintile 1	5.86	7.74	4.59	5.35	6.77	6.16	5.18	7.55	3.18
	Quintile 2	3.76	0.69	2.56	1.74	5.76	4.44	4.27	4.7	2.93
	Quintile 3	4.39	1.74	4.96	3.02	4.14	4.46	3.87	5.35	4.89
	Quintile 4	6.88	4.21	3.73	5.96	5.14	6.72	7.29	7.84	7.95
	Quintile 5	12.36	4.24	5.22	7.43	7.96	9.13	11.69	15.85	16.41
Male	ALL	8.02	1.92	3.66	5.12	6.54	8.23	8.89	10.24	10.07
	AIME Quintile									
	Quintile 1	6.49	0.47	4.15	7.34	7.91	5.99	9.35	6.29	2.69
	Quintile 2	3.59	1.97	2.03	3.05	2.66	5.83	2.81	3.64	4.37
	Quintile 3	3.9	1.28	1.8	2.36	3.01	4.2	4.45	4.17	4.41
	Quintile 4	5.76	1.5	2.25	3.4	4.47	4.55	5.81	7.8	8.2
	Quintile 5	10.59	2.44	4.59	6.03	7.9	10.74	11.84	14.36	15.92

Table 3-20
DC Benefit, Unisex

DC Benefit at 62 (as a Proportion of National Average Wages), Unisex Mortality, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.44	0.13	0.18	0.25	0.35	0.44	0.48	0.59	0.56
	AIME Quintile									
	Quintile 1	0.33	0.12	0.20	0.29	0.41	0.34	0.42	0.37	0.19
	Quintile 2	0.22	0.08	0.11	0.13	0.20	0.35	0.23	0.24	0.24
	Quintile 3	0.24	0.13	0.15	0.17	0.22	0.21	0.24	0.29	0.29
	Quintile 4	0.38	0.13	0.14	0.25	0.26	0.31	0.38	0.52	0.48
	Quintile 5	0.68	0.15	0.24	0.32	0.48	0.65	0.74	0.92	0.95
Female	ALL	0.39	0.15	0.17	0.22	0.32	0.35	0.42	0.53	0.48
	AIME Quintile									
	Quintile 1	0.30	0.17	0.21	0.25	0.41	0.32	0.29	0.38	0.18
	Quintile 2	0.21	0.07	0.11	0.12	0.22	0.28	0.24	0.25	0.23
	Quintile 3	0.24	0.15	0.17	0.18	0.24	0.21	0.25	0.28	0.30
	Quintile 4	0.42	0.22	0.19	0.33	0.30	0.35	0.41	0.58	0.47
	Quintile 5	0.77	0.47	0.29	0.31	0.53	0.60	0.77	0.96	0.94
Male	ALL	0.49	0.11	0.18	0.27	0.37	0.51	0.54	0.64	0.63
	AIME Quintile									
	Quintile 1	0.37	0.02	0.17	0.36	0.40	0.36	0.58	0.36	0.20
	Quintile 2	0.25	0.11	0.12	0.15	0.14	0.67	0.20	0.23	0.25
	Quintile 3	0.23	0.07	0.08	0.15	0.16	0.21	0.22	0.29	0.28
	Quintile 4	0.34	0.10	0.12	0.19	0.21	0.28	0.36	0.46	0.50
	Quintile 5	0.65	0.14	0.23	0.32	0.46	0.66	0.72	0.90	0.96

DC Benefit at 62 (as a Proportion of National Average Wages), Unisex Mortality, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.65	0.22	0.34	0.41	0.53	0.63	0.69	0.83	0.80
	AIME Quintile									
	Quintile 1	0.53	0.50	0.40	0.53	0.62	0.53	0.61	0.62	0.27
	Quintile 2	0.33	0.09	0.21	0.17	0.44	0.41	0.35	0.38	0.30
	Quintile 3	0.37	0.15	0.37	0.25	0.33	0.39	0.36	0.44	0.42
	Quintile 4	0.56	0.21	0.26	0.39	0.43	0.50	0.58	0.69	0.72
	Quintile 5	0.97	0.22	0.40	0.53	0.68	0.89	1.03	1.30	1.43
Female	ALL	0.60	0.29	0.37	0.37	0.50	0.56	0.62	0.77	0.71
	AIME Quintile									
	Quintile 1	0.52	0.68	0.41	0.47	0.59	0.55	0.46	0.67	0.28
	Quintile 2	0.33	0.06	0.23	0.16	0.50	0.39	0.38	0.42	0.26
	Quintile 3	0.39	0.16	0.45	0.27	0.37	0.39	0.34	0.47	0.43
	Quintile 4	0.61	0.37	0.33	0.52	0.46	0.60	0.65	0.70	0.71
	Quintile 5	1.10	0.37	0.48	0.65	0.71	0.81	1.04	1.41	1.46
Male	ALL	0.70	0.16	0.31	0.43	0.56	0.71	0.77	0.89	0.89
	AIME Quintile									
	Quintile 1	0.56	0.04	0.34	0.63	0.67	0.51	0.83	0.54	0.24
	Quintile 2	0.31	0.17	0.17	0.26	0.23	0.49	0.24	0.31	0.39
	Quintile 3	0.34	0.11	0.15	0.20	0.26	0.36	0.38	0.36	0.39
	Quintile 4	0.50	0.13	0.19	0.29	0.38	0.39	0.50	0.68	0.72
	Quintile 5	0.92	0.21	0.39	0.51	0.67	0.92	1.03	1.25	1.41

Table 3-21
DC Benefit, Individual

DC Benefit at 62 (as a Proportion of National Average Wages), Individual Mortality, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.40	0.12	0.17	0.23	0.32	0.40	0.44	0.53	0.50
	AIME Quintile									
	Quintile 1	0.29	0.11	0.18	0.27	0.36	0.30	0.37	0.33	0.17
	Quintile 2	0.20	0.07	0.10	0.12	0.18	0.32	0.20	0.22	0.21
	Quintile 3	0.22	0.12	0.14	0.16	0.20	0.19	0.22	0.26	0.26
	Quintile 4	0.34	0.12	0.14	0.23	0.23	0.29	0.35	0.47	0.44
	Quintile 5	0.62	0.15	0.22	0.30	0.44	0.60	0.67	0.83	0.86
Female	ALL	0.34	0.13	0.15	0.20	0.28	0.31	0.37	0.46	0.41
	AIME Quintile									
	Quintile 1	0.26	0.15	0.19	0.22	0.35	0.28	0.25	0.33	0.16
	Quintile 2	0.18	0.06	0.10	0.11	0.19	0.25	0.21	0.21	0.19
	Quintile 3	0.22	0.14	0.16	0.16	0.21	0.19	0.22	0.25	0.26
	Quintile 4	0.37	0.20	0.17	0.30	0.27	0.31	0.36	0.50	0.41
	Quintile 5	0.67	0.40	0.26	0.28	0.48	0.52	0.67	0.83	0.80
Male	ALL	0.45	0.11	0.18	0.26	0.35	0.48	0.51	0.60	0.58
	AIME Quintile									
	Quintile 1	0.35	0.02	0.16	0.34	0.38	0.34	0.53	0.34	0.19
	Quintile 2	0.24	0.11	0.11	0.15	0.13	0.66	0.19	0.22	0.23
	Quintile 3	0.22	0.07	0.08	0.15	0.16	0.20	0.21	0.28	0.26
	Quintile 4	0.32	0.10	0.12	0.19	0.20	0.26	0.34	0.43	0.46
	Quintile 5	0.60	0.14	0.22	0.31	0.44	0.62	0.67	0.83	0.89

DC Benefit at 67 (as a Proportion of National Average Wages), Individual Mortality, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.57	0.20	0.30	0.37	0.47	0.56	0.61	0.73	0.69
	AIME Quintile									
	Quintile 1	0.46	0.41	0.35	0.47	0.54	0.47	0.53	0.54	0.23
	Quintile 2	0.28	0.08	0.19	0.16	0.37	0.35	0.30	0.33	0.25
	Quintile 3	0.33	0.13	0.33	0.22	0.29	0.34	0.32	0.38	0.36
	Quintile 4	0.49	0.19	0.23	0.35	0.38	0.44	0.51	0.60	0.62
	Quintile 5	0.85	0.20	0.37	0.49	0.62	0.80	0.91	1.14	1.23
Female	ALL	0.50	0.25	0.32	0.32	0.43	0.47	0.52	0.64	0.59
	AIME Quintile									
	Quintile 1	0.43	0.56	0.35	0.41	0.49	0.46	0.38	0.55	0.23
	Quintile 2	0.28	0.05	0.20	0.14	0.42	0.33	0.31	0.34	0.21
	Quintile 3	0.33	0.14	0.39	0.23	0.31	0.34	0.29	0.40	0.36
	Quintile 4	0.52	0.32	0.29	0.44	0.40	0.50	0.55	0.58	0.59
	Quintile 5	0.91	0.31	0.41	0.56	0.60	0.68	0.87	1.16	1.17
Male	ALL	0.63	0.15	0.29	0.41	0.52	0.65	0.70	0.81	0.80
	AIME Quintile									
	Quintile 1	0.51	0.04	0.31	0.57	0.62	0.47	0.73	0.50	0.23
	Quintile 2	0.29	0.16	0.17	0.24	0.22	0.47	0.23	0.29	0.35
	Quintile 3	0.32	0.11	0.15	0.19	0.25	0.34	0.36	0.34	0.35
	Quintile 4	0.46	0.13	0.19	0.28	0.36	0.37	0.47	0.63	0.66
	Quintile 5	0.83	0.19	0.36	0.48	0.62	0.84	0.93	1.13	1.26

Table 3-22
IRA Balance

IRA Balance at 62 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	1.41	0.01	0.12	0.52	1.01	1.62	2.34	3.11	3.61
	AIME Quintile									
	Quintile 1	0.88	0.03	0.12	0.46	0.95	1.48	2.08	2.91	3.48
	Quintile 2	1.44	-	0.10	0.49	1.06	1.69	2.34	4.53	3.28
	Quintile 3	1.49	-	0.13	0.56	1.04	1.63	2.58	2.67	3.83
	Quintile 4	1.49	-	0.12	0.56	1.05	1.59	2.47	3.06	3.43
	Quintile 5	1.51	-	0.13	0.52	0.98	1.65	2.24	2.88	3.73
Female	ALL	1.47	0.02	0.12	0.54	1.04	1.70	2.51	3.10	3.51
	AIME Quintile									
	Quintile 1	0.90	0.04	0.13	0.46	0.96	1.56	2.24	3.18	3.78
	Quintile 2	1.25	-	0.10	0.50	1.02	1.67	2.43	3.03	3.59
	Quintile 3	1.47	-	0.13	0.59	1.09	1.61	2.76	2.93	3.57
	Quintile 4	1.82	0.01	0.11	0.64	1.13	1.73	2.77	3.42	3.24
	Quintile 5	2.17	-	0.16	0.56	1.01	1.90	2.24	2.98	3.58
Male	ALL	1.35	-	0.12	0.50	0.98	1.54	2.17	3.13	3.72
	AIME Quintile									
	Quintile 1	0.82	-	0.06	0.46	0.90	1.25	1.66	1.94	2.38
	Quintile 2	2.37	-	0.10	0.41	1.26	1.80	1.79	8.50	2.41
	Quintile 3	1.54	-	0.11	0.46	0.89	1.67	2.18	2.22	4.26
	Quintile 4	1.24	-	0.13	0.50	0.98	1.44	2.18	2.70	3.61
	Quintile 5	1.34	-	0.12	0.52	0.98	1.57	2.24	2.82	3.82

IRA Balance at 67 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	2.05	0.16	0.54	1.05	1.62	2.35	3.25	4.12	4.53
	AIME Quintile									
	Quintile 1	1.45	0.29	0.55	0.97	1.47	2.16	2.79	4.26	4.13
	Quintile 2	2.02	0.11	0.52	0.96	1.70	2.37	3.79	4.26	4.39
	Quintile 3	2.22	0.13	0.64	1.11	1.78	2.51	3.54	3.80	4.67
	Quintile 4	2.22	0.13	0.53	1.11	1.63	2.50	3.52	4.09	4.66
	Quintile 5	2.12	0.13	0.52	1.07	1.56	2.26	2.92	4.20	4.45
Female	ALL	2.25	0.21	0.58	1.11	1.73	2.54	3.62	4.51	4.65
	AIME Quintile									
	Quintile 1	1.47	0.33	0.58	0.98	1.47	2.34	3.03	4.57	4.13
	Quintile 2	2.01	0.10	0.54	0.98	1.67	2.41	3.92	4.20	4.74
	Quintile 3	2.28	0.14	0.67	1.19	1.91	2.71	3.79	4.08	4.89
	Quintile 4	2.70	0.19	0.55	1.32	1.88	2.74	4.04	4.79	4.83
	Quintile 5	3.05	0.16	0.62	1.22	1.71	2.46	3.16	4.80	4.35
Male	ALL	1.84	0.12	0.50	0.98	1.50	2.13	2.85	3.68	4.39
	AIME Quintile									
	Quintile 1	1.35	0.08	0.40	0.92	1.45	1.68	2.21	3.23	4.10
	Quintile 2	2.07	0.16	0.44	0.75	1.91	2.14	2.91	4.44	3.23
	Quintile 3	2.07	0.11	0.51	0.83	1.43	1.94	2.99	3.27	4.30
	Quintile 4	1.81	0.11	0.52	0.93	1.40	2.20	3.00	3.40	4.49
	Quintile 5	1.84	0.13	0.51	1.04	1.52	2.18	2.81	3.85	4.52

Table 3-23
IRA Benefit, Unisex

IRA Balance at 62 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	1.41	0.01	0.12	0.52	1.01	1.62	2.34	3.11	3.61
	AIME Quintile									
	Quintile 1	0.88	0.03	0.12	0.46	0.95	1.48	2.08	2.91	3.48
	Quintile 2	1.44	-	0.10	0.49	1.06	1.69	2.34	4.53	3.28
	Quintile 3	1.49	-	0.13	0.56	1.04	1.63	2.58	2.67	3.83
	Quintile 4	1.49	-	0.12	0.56	1.05	1.59	2.47	3.06	3.43
	Quintile 5	1.51	-	0.13	0.52	0.98	1.65	2.24	2.88	3.73
Female	ALL	1.47	0.02	0.12	0.54	1.04	1.70	2.51	3.10	3.51
	AIME Quintile									
	Quintile 1	0.90	0.04	0.13	0.46	0.96	1.56	2.24	3.18	3.78
	Quintile 2	1.25	-	0.10	0.50	1.02	1.67	2.43	3.03	3.59
	Quintile 3	1.47	-	0.13	0.59	1.09	1.61	2.76	2.93	3.57
	Quintile 4	1.82	0.01	0.11	0.64	1.13	1.73	2.77	3.42	3.24
	Quintile 5	2.17	-	0.16	0.56	1.01	1.90	2.24	2.98	3.58
Male	ALL	1.35	-	0.12	0.50	0.98	1.54	2.17	3.13	3.72
	AIME Quintile									
	Quintile 1	0.82	-	0.06	0.46	0.90	1.25	1.66	1.94	2.38
	Quintile 2	2.37	-	0.10	0.41	1.26	1.80	1.79	8.50	2.41
	Quintile 3	1.54	-	0.11	0.46	0.89	1.67	2.18	2.22	4.26
	Quintile 4	1.24	-	0.13	0.50	0.98	1.44	2.18	2.70	3.61
	Quintile 5	1.34	-	0.12	0.52	0.98	1.57	2.24	2.82	3.82

IRA Balance at 67 (as a Proportion of National Average Wages), by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	2.05	0.16	0.54	1.05	1.62	2.35	3.25	4.12	4.53
	AIME Quintile									
	Quintile 1	1.45	0.29	0.55	0.97	1.47	2.16	2.79	4.26	4.13
	Quintile 2	2.02	0.11	0.52	0.96	1.70	2.37	3.79	4.26	4.39
	Quintile 3	2.22	0.13	0.64	1.11	1.78	2.51	3.54	3.80	4.67
	Quintile 4	2.22	0.13	0.53	1.11	1.63	2.50	3.52	4.09	4.66
	Quintile 5	2.12	0.13	0.52	1.07	1.56	2.26	2.92	4.20	4.45
Female	ALL	2.25	0.21	0.58	1.11	1.73	2.54	3.62	4.51	4.65
	AIME Quintile									
	Quintile 1	1.47	0.33	0.58	0.98	1.47	2.34	3.03	4.57	4.13
	Quintile 2	2.01	0.10	0.54	0.98	1.67	2.41	3.92	4.20	4.74
	Quintile 3	2.28	0.14	0.67	1.19	1.91	2.71	3.79	4.08	4.89
	Quintile 4	2.70	0.19	0.55	1.32	1.88	2.74	4.04	4.79	4.83
	Quintile 5	3.05	0.16	0.62	1.22	1.71	2.46	3.16	4.80	4.35
Male	ALL	1.84	0.12	0.50	0.98	1.50	2.13	2.85	3.68	4.39
	AIME Quintile									
	Quintile 1	1.35	0.08	0.40	0.92	1.45	1.68	2.21	3.23	4.10
	Quintile 2	2.07	0.16	0.44	0.75	1.91	2.14	2.91	4.44	3.23
	Quintile 3	2.07	0.11	0.51	0.83	1.43	1.94	2.99	3.27	4.30
	Quintile 4	1.81	0.11	0.52	0.93	1.40	2.20	3.00	3.40	4.49
	Quintile 5	1.84	0.13	0.51	1.04	1.52	2.18	2.81	3.85	4.52

Table 3-24
IRA Benefit, Individual

IRA Benefit at 62 (as a Proportion of National Average Wages), Individual Mortality, by Birth Cohort and AIME Quintile
Age 62 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.10	-	0.01	0.04	0.07	0.11	0.17	0.22	0.25
	AIME Quintile									
	Quintile 1	0.06	-	0.01	0.03	0.07	0.10	0.15	0.20	0.24
	Quintile 2	0.10	-	0.01	0.04	0.08	0.12	0.16	0.31	0.23
	Quintile 3	0.11	-	0.01	0.04	0.07	0.12	0.18	0.19	0.27
	Quintile 4	0.11	-	0.01	0.04	0.07	0.11	0.18	0.21	0.24
	Quintile 5	0.11	-	0.01	0.04	0.07	0.12	0.16	0.20	0.26
Female	ALL	0.10	-	0.01	0.04	0.07	0.12	0.17	0.21	0.24
	AIME Quintile									
	Quintile 1	0.06	-	0.01	0.03	0.07	0.11	0.16	0.22	0.26
	Quintile 2	0.09	-	0.01	0.04	0.07	0.12	0.17	0.21	0.25
	Quintile 3	0.10	-	0.01	0.04	0.08	0.11	0.19	0.20	0.24
	Quintile 4	0.13	-	0.01	0.05	0.08	0.12	0.19	0.23	0.22
	Quintile 5	0.15	-	0.01	0.04	0.07	0.13	0.15	0.20	0.24
Male	ALL	0.10	-	0.01	0.04	0.07	0.11	0.16	0.22	0.27
	AIME Quintile									
	Quintile 1	0.06	-	-	0.03	0.06	0.09	0.12	0.14	0.17
	Quintile 2	0.17	-	0.01	0.03	0.09	0.13	0.13	0.59	0.17
	Quintile 3	0.11	-	0.01	0.03	0.07	0.12	0.16	0.16	0.31
	Quintile 4	0.09	-	0.01	0.04	0.07	0.10	0.16	0.20	0.26
	Quintile 5	0.10	-	0.01	0.04	0.07	0.11	0.16	0.20	0.28

IRA Benefit at 67 (as a Proportion of National Average Wages), Individual Mortality, by Birth Cohort and AIME Quintile
Age 67 Scenario

			Birth Cohort							
		ALL	<1931	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961+
ALL	ALL	0.16	0.01	0.04	0.08	0.12	0.18	0.25	0.31	0.34
	AIME Quintile									
	Quintile 1	0.11	0.02	0.04	0.08	0.11	0.16	0.21	0.32	0.32
	Quintile 2	0.15	0.01	0.04	0.07	0.13	0.18	0.28	0.32	0.33
	Quintile 3	0.17	0.01	0.05	0.09	0.14	0.19	0.27	0.29	0.35
	Quintile 4	0.17	0.01	0.04	0.09	0.13	0.19	0.27	0.31	0.36
	Quintile 5	0.16	0.01	0.04	0.08	0.12	0.17	0.22	0.32	0.34
Female	ALL	0.17	0.02	0.05	0.09	0.13	0.19	0.27	0.33	0.34
	AIME Quintile									
	Quintile 1	0.11	0.02	0.05	0.08	0.11	0.18	0.23	0.34	0.31
	Quintile 2	0.15	0.01	0.04	0.08	0.13	0.18	0.29	0.31	0.35
	Quintile 3	0.17	0.01	0.05	0.09	0.14	0.20	0.28	0.30	0.36
	Quintile 4	0.20	0.01	0.04	0.10	0.14	0.20	0.30	0.35	0.36
	Quintile 5	0.22	0.01	0.05	0.09	0.13	0.18	0.23	0.35	0.31
Male	ALL	0.15	0.01	0.04	0.08	0.12	0.17	0.22	0.29	0.35
	AIME Quintile									
	Quintile 1	0.11	0.01	0.03	0.07	0.11	0.13	0.17	0.27	0.34
	Quintile 2	0.16	0.01	0.03	0.06	0.15	0.17	0.23	0.35	0.25
	Quintile 3	0.17	0.01	0.04	0.07	0.12	0.16	0.24	0.26	0.34
	Quintile 4	0.14	0.01	0.04	0.08	0.11	0.17	0.24	0.27	0.36
	Quintile 5	0.14	0.01	0.04	0.08	0.12	0.17	0.22	0.30	0.36

3. Accounting for Retirement Prior to Age 62 (67). The previous pension model assumed that all workers continue on their current job until age 62. However, some people stop working prior to attaining age 62. Therefore, we use output from the earnings projections module to take into account retirement prior to age 62 (67). Rather than assuming that workers continue to work up to age 62 (67), we assume that workers work up to the time their earnings drop to zero (or until ages 62 (67), whichever comes first). Note however, that even for workers who stop working prior to age 62 (67), we assume that they do not start collecting their pension benefits until age 62 (67).

4. Incorporating Cost-of-living Adjustments (COLAs). The prior model did not include any provisions for cost-of-living adjustments (COLAs). We incorporated COLAs for two reasons. First, in the pension projection module, we need to project the pension income at ages 62 and 67 for persons already collecting pension income at the time of the SIPP interview. These projections need to account for any cost-of-living adjustments granted between the time of the interview and ages 62 and 67. Second, when projecting income to the year 2020 in Chapter 7, DB pension income estimates need to account for any cost-of-living adjustments.

5. Accounting for Job Changes. The prior model assumed that workers will continue at their current job until retirement. However, few workers remain on the same job throughout their career. Workers with defined benefit coverage who change jobs receive lower pension benefits than those who do not change jobs. This results in part because the salaries used in benefit computations are not indexed. Therefore, we adjust benefits to take into account future job changes among workers with DB coverage. This involves two steps. First we determine who changes a job and if so how often. Second, we determine how benefits are reduced for those who change jobs.

6. Inclusion of Widow(er) Benefits. The previous pension model ignored any pre-retirement survivor benefits. This understates the income for widow(er)s whose spouses died prior to receiving their pension income. We revised the model to include pre-retirement DB survivor benefits. We also transfer the account balances of workers who die prior to age 62 (67) to their surviving spouses. The account balances continue to accrue interest until the surviving spouse attains age 62 (67), but no additional contributions are made. When the surviving spouse attains age 62 (67), the account balance is annuitized. If the surviving spouse is already age 62 (67) or older, we annuitize the balance as of the date of the worker's death.

7. Inclusion of Benefits for Older Individuals in the Sample. The prior model accounted for neither the current receipt of pension income nor for pensions from previous jobs. Both of these omissions cause pension income to be understated in the prior SIPP/DPE model, particularly for older individuals in the SIPP file. We revised the pension module to include these pension benefits.

8. Refined Employer Match Rates. We updated the employer match assumptions. For 401(k) plans, the previous model assumed a 50 percent match rate for all employee contributions. For non-401(k) contributory DC plans, the previous model assumed a 50 percent match rate for employees who contribute less than 16 percent of pay and an employer contribution of 7 percent of pay for employees who contribute more than 16 percent of pay (the maximum combined contribution was set at 25 percent of pay). We refined these assumptions so that they more closely parallel the distribution of employer match rates.

9. Refined Rate of Return. The prior model set the rate of return stochastically with an assumed rate of 3.5 percent (a blend of stock and interest bearing rates of return) and a standard deviation equal to the assumed rate. The variation accounts for differences in investment allocation across those with DC plans. We have updated the model to include assumptions regarding investment allocation. We assume that 50 percent of account balances are invested in stocks and 50 percent are invested in bonds. We also assume that 50 percent of new contributions are allocated to stocks and 50 percent are allocated to bonds. Then we apply the stock rate of return to the stock allocations and the bond rate of return to the bond allocations. We continue to set these rates stochastically (i.e., we draw them from a normal distribution).

10. Refined Annuitization Assumptions. The prior model used insurance industry annuity rates to convert DC and IRA account balances at retirement into an annual flow of annuity income. We produce two estimates of annual annuitized benefits from account balances at retirement. The first uses unisex mortality assumptions based on the 1989-1991 Decennial Life Tables, as published by the NCHS. The second uses mortality assumptions, developed by RAND based on PSID data, that vary by gender, birth year, race, and education.

VII. POTENTIAL FUTURE IMPROVEMENTS TO THE MODEL

1. Explicitly Modeling Different Retirement Dates From DB Plans. The current model assumes that individuals do not begin collecting pension benefits until age 62 (67) regardless of whether they left the labor force prior to attaining this age. In future versions of the model, it may be preferable to relax this assumption,

which would require additional coordination with the assets projection module. This modification would complement a revision of the earnings model (described in Chapter 2) to include a more explicit projection of the retirement decision between ages 55 and 61.

2. Match Actual Plan Data to SIPP Pension Plan Participants. It may be preferable to use actual plan data rather than BLS replacement rates for workers with DB coverage. Possible data sources are the Health and Retirement Study (HRS) pension plan data and PBGC's PIMS model.

3. Incorporate Cash Balance Plans. The current model does not incorporate cash balance plans. It might be desirable to include cash balance plans as more data on these plans becomes available.

4. Incorporate a More Sophisticated Job Transition Subroutine. Rather than applying benefit reduction rates to account for benefits lost due to job transitions, it might be preferable to actually simulate a work history for each worker. The probability of changing jobs in any given year could reflect gender, age, tenure, industry, occupation, pension coverage, etc. This option, especially when combined with the option for matching actual pension plans to workers, could enhance the model's ability to estimate pension benefits for workers who change jobs.

5. Varying DC Contribution Rates and Asset Allocations Over Time. In future versions of the model, it might be desirable to allow for various contribution rates by age, gender, tenure, and/or income. It might also be desirable to allow for various allocation strategies by age, gender, tenure, and/or income, and to allow for portfolio rebalancing. Time and resource constraints made it impractical to incorporate such variations in this version of the model. The EBRI/ICF database on 401(k) plans is a potential source for informing these types of enhancement.

6. Lump Sum Distributions. In the event that a worker changes jobs or leaves the work force, the model assumes that all account balances are left to accumulate. In future versions of the model, it might be preferable to allow workers to take lump sum distributions. This would require coordination with the non-pension asset accumulation module described in Chapter 4.

CHAPTER 3: REFERENCES

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CHAPTER 3: LIST OF TABLES

CHAPTER 3: ENDNOTES

1. Rather than applying benefit reduction rates to account for benefits lost due to job transitions, we considered simulating a work history for each worker, with the probability of changing jobs in any given year reflecting gender, age, tenure, industry, occupation, pension coverage, etc. Because of the time and resource constraints we chose the former option. The latter option might be worth considering for future versions of the model.